

The ITU WRC-03 conference has amended Article 25, removing the mandatory Morse requirement for unrestricted amateur licenses. The revised wording allows each administration to determine for itself whether Morse proficiency should be a requirement for an amateur license.

Those who doubt whether CW is useful do so because they fail to look at CW in terms of our objectives as amateurs. Some of the opponents of Morse code testing note that most commercial and some military services no longer use CW, and provide that as “evidence” that the mode is no longer useful, or at least not “best of class”. However commercial and military requirements and constraints are very different from those facing amateurs. For these services, traffic volume is often the most important consideration; there are rarely any power or equipment limitations; bandwidth limitations are less severe than in the amateur bands; good signals can often be assured by the use of very high power transmitters or satellite communications; and skilled operators are considered an unnecessary expense.

However the requirements and constraints facing amateurs are very different, which means that the optimum mode of communication is also different, and in many cases it is CW.

For example, consider the fallacy of comparing modes by traffic volume. When I listen to amateur stations operating in all modes, the thing that strikes me most is how little information is being communicated by most of them. Not because they are hamstrung by inefficient modes, but because they don’t actually have very much to say to each other. There are exceptions of course, but the majority of QSOs consist simply of an exchange of signal reports, name and QTH, station and weather information.

For many amateur activities, traffic volume is not a significant consideration, so one cannot argue that CW is an unimportant mode for the amateur service simply because commercial services, for which traffic volume is the key requirement, no longer make widespread use of it.

When it comes to QSO rate, CW and phone are about equally matched. For example in last year’s IARU HF World Championships, where the phone and CW contests take place during the same 24 hour period and under the same propagation conditions, the top single-operator phone station was KH6ND with 2,451 QSOs, while the top single-operator CW station was P3F with 2,816 QSOs. Digital modes trail slightly – although the IARU HF contest does not include digital modes, a comparative figure is the 1,912 QSOs made by KI1G, the top entrant in the ARRL RTTY roundup

One of the areas where CW is clearly superior to most other modes is bandwidth efficiency. CW can achieve a similar QSO rate to phone while accepting a channel spacing of 250 Hz or less, compared

with the 2 500 Hz minimum required by phone. This means that the QSO rate per Hertz of bandwidth occupied is at least ten times greater for CW than it is for phone. The only other mode that can compete with this remarkable efficiency is PSK-31. Bandwidth efficiency is especially important in the amateur service given our limited amateur allocations.

When it comes to weak-signal performance, CW is a clear leader on the HF bands. Listening tests have shown that SSB operator-to-operator grade service with 90% intelligibility of related words by trained operators requires a signal to noise ratio of 48 dB-Hz for a bandwidth of 3 KHz. A similar level of intelligibility can be obtained with a CW signal to noise ratio of 27 dB-Hz in a 500 Hz bandwidth, while RTTY requires a signal to noise ratio of 55 dB-Hz. This means that for the same level of intelligibility, a phone signal requires 11 dB more power than a CW signal; and an RTTY signal requires 28 dB more power. For CW signals in a 250 Hz bandwidth the advantage over SSB is about 13 dB. In other words, to achieve the same intelligibility under poor conditions as a 100 W CW signal you would require a 2 KW SSB signal.

The relative power efficiency of CW is of particular benefit to operators who use simple low-powered stations, which is likely to be the case for operators from previously disadvantaged communities. It will become ever more important as we move deeper into the trough of the solar cycle over the next few years.

One of the objectives of amateur radio is to encourage home construction. Here CW has a distinct advantage, since CW transceivers are inherently less complex, and hence less expensive and easier to construct than, phone transceivers.

CW transceivers also often have significantly lower power drain than multi-mode designs. For example, the Elecraft K1 draws only 55 mA on receive. This makes CW transceivers ideal for battery-powered operations, for example for operations from mountain summits. Commonly used portable SSB transceivers like the Yaesu FT-817 draw as much as 450 mA, making them much less suited to sustained battery-powered operation.

The abbreviations and pro-signs used in CW communications make it possible for operators who do not speak the same language to communicate at least basic information. This means that proficiency in English is not a requirement for successfully communicating worldwide using CW, which is an obvious benefit in our attempts to facilitate amateur radio amongst previously disadvantaged communities.

One of the roles of the amateur service is to provide emergency communications in the event of a national disaster. Many different modes might be utilized, depending on the circumstances. If the

emergency is localized, then FM repeater communications are likely to play the leading role. For more widespread emergencies, HF communications are important. If the emergency leaves computer systems operational, and if propagation is fairly good, then digital modes might be most effective. If computers are unavailable, then SSB might be the mode of choice. If we lose our computers and have to operate with limited power (for example from backup batteries or solar power) or under poor propagation conditions, then CW might be the best (and only) way to get through.

CW satisfies the key requirement for a high QSO rate. CW also makes better use of limited amateur spectrum than most other modes. If you have a limited budget or power or antenna restrictions, then CW provides you with better intelligibility under poor signal conditions than any other common HF mode. If you want to construct your own equipment, then CW allows simpler and less expensive transceiver projects. If you want to operate from remote places using battery or other alternative power, then CW is the most power-efficient mode. And under certain emergency conditions, CW may be the only mode possible.

For these reasons I believe that no-one can honestly claim that CW is no longer a useful, or even an important, mode of communications.

Having established that CW is both a useful and a popular mode of amateur communication, it is easy to show that our education and examination syllabus should include at least the basic abilities required to operate in this mode. After all, one of the main purposes of the syllabus and examination is to equip new amateurs to operate efficiently, legally and safely using the most common and useful modes.

Morse proficiency is an indicator of a desirable, motivated or better qualified operator.

Anecdotally I can report that I have never, ever heard profanity or personal insults on CW. This is in stark contrast with the bad language and worse manners of some of the operators on FM repeaters. But this is purely anecdotal and does not count as evidence, and I have not relied upon it as a reason for retaining Morse. I must also add that the great majority of operators on the FM repeaters are also courteous and professional, and the bad behavior mentioned is confined to just a few, many of whom remain anonymous.

The Morse code requirement does not pose an advancement barrier to many otherwise qualified

individuals.

Electronics theory also serves as a barrier to many people who would otherwise make good operators. This is not a good reason to ditch electronic theory from the syllabus.

Morse code communications is primarily recreational. However this misses the point that the Amateur Service as a whole is primarily recreational in nature, as are all the modes used. So if this was a good reason not to teach CW competence, then it is an equally good reason not to teach competence in SSB, FM, RTTY, PSK-31 and Packet as the use of all these modes in the Amateur Service is “primarily recreational in nature”.

The use of CW may stabilise at a lower number than at present, or it may lose critical mass and eventually die out altogether. After all, in order to become proficient in CW usually requires some sort of encouragement or tuition, so if there aren't sufficient CW operators around there won't be anyone to train those newcomers who would like to learn. And many new amateurs who would have enjoyed CW and become skilful operators if introduced to Morse code during their training will lose the opportunity to discover it for themselves.

Some new operators who would have spent much of their time operating CW in a 250 Hz bandwidth will instead operate SSB with a 2.5 KHz bandwidth. They will find that 100 W just does not cut it under poor conditions, and purchase linear amplifiers. The reduced number of CW operators may result in some or all of the current CW allocations being reallocated to phone; but this will not reduce congestion. On the contrary, even with additional allocations the bands will be more congested due to the higher proportion of 2.5 KHz bandwidth signals.

The resulting perception that expensive linear amplifiers and antenna systems are required to communicate effectively when conditions are poor is likely to be a much more serious barrier to entry amongst previously disadvantaged communities than any Morse test. After all, people from these communities are generally willing to invest their time to acquire new skills, while significant financial investments are simply not possible.

Of course some will argue that even if the Morse code requirement is abolished, those who want to learn it will still do so, and that if this is insufficient to keep the mode alive well, then, it was a dying mode anyway and best left to its fate. However this argument is fundamentally flawed, as can be seen if it is applied to any other aspect of amateur radio.

Doing away with the Morse code requirement may result in the eventual demise of CW as a mode of

operation. It does not follow that CW had outlived its usefulness. Similarly, even though the abolition of the electronics component of our syllabus might result in the demise of home construction, this does not mean that home construction and technical ability have outlived their usefulness. CW is an important component of the Amateur Radio Service, and as such the FCC must continue the Morse code examinations.

CW is both a useful and a popular mode of communication amongst amateurs. A key purpose of our training and examination syllabus is to equip new amateurs with the basic abilities they need to make use of all useful and popular modes, and that in the case of CW this means training and examining candidates in Morse code.

Doing away with the Morse code requirement will result in the decline or even the eventual demise of an important mode that offers many advantages for today's amateurs. It would compromise our ability to provide emergency communications. Doing away with Morse means accepting the need for higher power and more complex and expensive antenna systems in order to communicate effectively under poor propagation conditions which will reduce the appeal of amateur radio in previously disadvantaged communities.

I therefore recommend that the FCC support the retention of a Morse code requirement for the issuing of amateur licenses. This does not exclude the possibility that some HF access could be given to other license classes that do not include a Morse code requirement.